

**ABSTRACT**

A single crystal diamond grown by vapor phase synthesis, wherein when one main surface is irradiated with a linearly polarized light considered to be the synthesis of two mutually perpendicular linearly polarized light beams, the phase difference between the two mutually perpendicular linearly polarized light beams exiting another main surface on the opposite side is, at a maximum, not more than 50 nm per 100  $\mu\text{m}$  of crystal thickness over the entire crystal. This single crystal diamond is of a large size and high quality unattainable up to now, and has characteristics that are extremely desirable in semiconductor device substrates and are applied to optical components of which low strain is required.